

Four important pieces of paper By Bill O'Brien

If you ask any GA pilots what kind of aircraft paperwork the FAA requires them to have to have in the aircraft prior to flight, they will automatically respond with the acronym ARROW, which until just recently stood for airworthiness certificate, registration certificate, radio station license, operating manual, and weight and balance.

Just when we had everybody trained for a fast and accurate pavlovian response, wouldn't you know that another government agency, the Federal Communications Commission, would come along and drop the requirement to have a radio station license for all U.S. registered aircraft operating in the domestic U.S. airspace. The new FCC rule became effective on Dec. 12, 1996, and on that same day it destroyed our "ARROW" acronym.

So now the acronym specialist in the FAA headquarters is pulling out his hair trying to come up with another buzz word so future "four stripers" can remember their paperwork requirements. By the way, any suggestions that any of you might have on what the new acronym should be will be gratefully accepted. Please submit your suggestion to:

General Aviation Operations
Branch, AFS-800
Attention: John Wensel
800 Independence Ave., SW
Washington, D.C. 20593

Since this kind of paperwork is important, I would now like to go over the four remaining pieces of paper and see how they apply to mechanics, repair stations, and air carrier maintenance departments.

Registration certificate

The registration certificate is the most important regulatory document in the aircraft. You heard me right. The registration certificate is No. 1, the first in line. Why? In accordance with international agreements, the FAA cannot issue an airworthiness certificate or issue an airworthiness directive against an aircraft unless that aircraft is registered in the United States and a N number is assigned and displayed on the aircraft.

I sense some disbelief. You argue that everybody knows the airworthiness certificate is the most important piece of paper because that document defines what airworthy is and sets the standards for it. You are absolutely right, but as important as the definition and standards are, that still does not make the airworthiness certificate No. 1. If you don't believe me just read a standard airworthiness certificate. The very first block of the certificate calls out the nationality and registration number of the aircraft, so the aircraft must be registered first in order to get an airworthiness certificate.

I can also beef up my argument by pointing to Block six of the airworthiness certificate where it lists the terms and conditions for the airworthiness certificate. In Block 6 it states that the certificate will remain in effect as long as the aircraft is registered in the United States. So I hope I have convinced you that the most important regulatory certificate of all the aircraft's paperwork is the registration certificate.

So far we have established that the registration certificate is important, but how does it apply to mechanics? First, as a holder of a FAA mechanic's certificate, you cannot legally approve or return to service any work that you have performed on a foreign-registered aircraft. The FAA, by international law, can only grant privileges and limitations to certificate holders that work on N-numbered registered aircraft.

I am well aware that owners of foreign aircraft like to get work done in the United States and as part of the contract they want the work signed off in accordance with Sections 43.9 (maintenance) or 43.11 (inspections), and the work is performed in accordance with section 43.13 (performance rules).

Will this conflict between earning a living and adhering to the FAR get you in trouble with the FAA? Will you be doomed to sleep with a night light on? The answer is no. Because the FAA has no legal jurisdiction over what is put in a foreign-registered aircraft's logbook.

The mechanic does not have any legal authority or responsibility from the FAA to make the entry, but if the customer wants you to sign off the work with your certificate number, go right ahead and sign the books. It is the owner or operator of the foreign-registered aircraft who is responsible for the maintenance records of his aircraft, not you, and certainly not the FAA.

However, I would like to make one exception to my last statement that is hovering on the not too distant political horizon — a FAA repair station that works on a foreign-registered aircraft which is registered with a country that the United States has a maintenance bilateral. If that is the case, then the FAA repair station will be allowed to sign off the work on foreign-registered aircraft under the repair station's FAA certificate number.

As of this moment in time the United States has signed a bilateral aviation maintenance agreement (BASA) with five countries — England, Germany, Netherlands, France, and Switzerland. A BASA is a formal agreement signed at the state department level by which we agree to accept each other's standards of maintenance. However, none of the five countries we signed the BASA with has signed the bilateral implementation document with the United States. This document describes the who, what, when, where, and how all this acceptance will be met, so nothing has happened yet. Despite the glacial speed of international diplomacy, we should see at least one of the implementation documents be signed by late fall of this year.

Another question that always comes up concerning registration certificates is when a mechanic or IA, in the course of performing an annual inspection, discovers that either the registration certificate is missing or the pink temporary copy is out of date. Can he still sign off the annual?

The answer is yes. The IA can perform the annual and sign it off, approving the aircraft for return to service because the owner or operator is responsible for the paperwork, not the IA.

However, the IA should notify the owner or operator of the aircraft in writing or on the work order that the registration is missing or out of date and the aircraft cannot fly until the paperwork is current and on board (Ref. Section 45.3).

Airworthiness certificate

If I was asked what single word describes what a mechanic is, what he does, and what standards he is held to, that word would be "airworthy" and its definition and standards would be found on the standard airworthiness certificate.

Check out Block 5 of the airworthiness certificate. In Block 5 the term "airworthy" is defined as when the aircraft meets its type design and therefore, in a condition for safe operation. The term airworthy, although not found in FAR I definitions and abbreviations, is further defined in FAA advisory circulars, FAA orders, NTSB case law decisions, and on the standard airworthiness certificate. While there is some variation on the theme, the most common definition of airworthy is: when an aircraft or one of its component parts meets its type design or properly altered condition and is in a condition for safe operation.

If you examine the definition there are really two major requirements to be met in order for a mechanic to declare that the item he or she worked on is airworthy.

The first requirement is that the aircraft meets its type design. Most mechanics would immediately go either to the older type certificate specification sheet, which were produced under the original civil aviation administration and adopted by the FAA or the FAA data sheet for the aircraft.

The older specification sheet is my personal favorite because it is filled with a lot of good maintenance information, such as primary flight control travel in degrees or the engine to magneto timing information. The FAA data sheet on the other hand is similar to a brief overview of the aircraft, engine, or propeller. Be it specification or type data sheet, many mechanics considered it the definitive document for type design.

But they would be wrong. Because in the vast majority of cases, the aircraft itself no longer meets the original type design specification or data sheet.

Before we get too excited, I am not saying that the vast majority of aircraft are not airworthy.

What I am saying is that the average age of most GA aircraft fleet is now over 25 years of age.

They have had their original type design for the aircraft, engine, or propeller altered, either by one or more STC or field approvals being performed or had its type design changed by an airworthiness directive or two.

So now if you compared that original specification or data sheet to the aircraft, engine, or propeller, it would be just like comparing your old picture in a high school year book to your photo on your driver's license. If you still expect the two to be a spitting image of one another, you would be disappointed.

The point that I am trying to make is that for mechanics to ensure that the aircraft meets its type design, they should check not only the applicable specification or data sheet, but any STC, field approval, or AD that changed the type design. Some of the type design changes may require additional maintenance requirements such as the continuous maintenance requirements, found in some STC that were applied for after Jan. 28, 1981 (Ref. Section 21.50).

"Condition for safe operation" is the second part of the term airworthy. This concept is a little harder to define because in reality it is all about "wear," and how much is safe or how much is the manufacturer going to allow. Unlike the meeting type design requirement which is spelled out in blood and concrete, "condition for safe operation" requires the use of experience, judgement, data, measurement, testing, inspection, and maintenance on the part of the mechanic to make it happen. However, not all mechanics reach the same conclusion when determining "condition for safe operation." Some of the biggest fights I have seen on a hangar floor were about the lack of rubber tread on a tire or whether a crooked line on a cylinder head was a crack or a surface deformity. In Block 6 terms and conditions of the airworthiness certificate, the standards that a mechanic must meet are also spelled out. For the airworthiness certificate to remain in effect the maintenance, preventive maintenance, and alterations must be performed in accordance with Part 21 (certification of products and parts), Part 43 maintenance (preventive maintenance, rebuilding, and alteration), and Part 91 (general operating and flight rules).

Operating manual or flight manual

The "O" in the old arrow acronym stood for operating manual which could also mean the flight manual. Part 21, Section 21.5 requires all aircraft produced after March 1, 1979 to have a current and approved airplane or rotorcraft flight manual. For aircraft manufactured prior to that date, a flight manual sometimes supplied with the aircraft or the flight and performance information was supplied in the form of placards scattered throughout the cockpit or cabin.

While most mechanics insure that all the placards are intact, they only give the flight manual a brief review. It deserves a little more attention because it is a piece of required equipment by regulation and identified as such on many aircraft type certificate data sheets. Not only should it be in the aircraft, but the flight manual must be kept current. This is again the owner or operator's responsibility, but a mechanic should tell the owner when the flight manual is out of date or missing altogether.

Weight and balance

information

Weight and balance is the most important technical piece of paper in the aircraft because it is directly related to airworthiness. Despite its importance, it is universally ignored by everybody who operates and maintains small general aviation aircraft. I have personally inspected a fair number of GA aircraft as an IA and as a FAA inspector. Sitting in the pilot's seat examining the paperwork, I usually found three or four old weight and balance forms on paper the color of old teeth. All of the forms were 10 years old or older, and yet just 3 feet away staring me in the face is a brand new communication/navigation installation.

Most of the time, with my gentle urging, the owner would dig up the latest weight and balance form at home or more likely find it attached to a Form 337 that was buried in the aircraft's maintenance records. Because weight and balance affects every portion of flight, the weight and balance record should be reviewed by mechanics and IA during 100 hour and annual inspections and checked for currency and accuracy. Without a good weight and balance, every aircraft flight is a hypocrisy.

To sum it up. The registration certificate is the most important, according to the FAR; the airworthiness certificate defines "airworthy" and the standards to meet it; the operation manual identifies the performance limits and other requirements for the pilot; and the weight and balance sheet is the most important technical document required to be on the aircraft.

There you have it. AROW, WARO, or whatever acronym you want to assign to the four most important pieces of paper that must be in the aircraft prior to flight.